

DOA-GAN: Dual-Order Attentive Generative Adversarial Network for Image Copy-Move Forgery Detection and Localization

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Abstract

Images can be manipulated for nefarious purposes to hide content or to duplicate certain objects through copy-move operations. Discovering a well-crafted copy-move forgery in images can be very challenging for both humans and machines; for example, an object on a uniform background can be replaced by an image patch of the same background. In this paper, we propose a Generative Adversarial Network with a dual-order attention model to detect and localize copy-move forgeries. In the generator, the first-order attention is designed to capture copy-move location information, and the second-order attention exploits more discriminative features for the patch co-occurrence. Both attention maps are extracted from the affinity matrix and are used to fuse location-aware and co-occurrence features for the final detection and localization branches of the network. The discriminator network is designed to further ensure more accurate localization results. To the best of our knowledge, we are the first to propose such a network architecture with the 1st-order attention mechanism from the affinity matrix. We have performed extensive experimental validation and our state-of-the-art results strongly demonstrate the efficacy of the proposed approach.